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|  | Hello, Universe.™ | SAI – FCC        |       |
|   |                   | Date: 22/02/2021 |       |
|   |                   | SAI-2            | Pag:1 |

## **SAI-2 Experimental**

### **Mission and Technical Description**

The overall goal of the SAI-2 mission is to test and operate a prototype spacecraft bus in a space environment, to provide space heritage, and performance feedback for the design.

SAI-2 is a 6U CubeSat with an overall dimension of 10 cm X 20 cm X 30 cm, fully compliant with the 6U CubeSat Design Specification Revision 1.0 (CP-6UCDS-1.0 California Polytechnic State University). It is intended as a technology demonstrator for advanced communications and supercomputer architectures. Node I is an advanced SDR communications card designed to be used on CubeSats missions. The main purpose is to test the main operational aspects of the card (radios, sensors) and the communication performance in the broad range of operation for the radio, this is why we are requesting several frequency allocations in order to test as much as possible the radio performance, both for Space-to-Earth and Earth-to-Space operations. Also, Space AI will be able to test the Node IO that is a system fully contained in a 0.5U to provide wireless connectivity in a sensor cloud environment.

The satellite will be delivered no later than June 5<sup>th</sup> to Space X to be integrated to a Falcon 9 rocket.

SAI-2 spacecraft will be deployed into a circular LEO orbit of 550KM at TBD degrees.

The experimental SAI-2 mission is a free flying mission and is scheduled to flight by end of June 2021. The intended mission duration is 24 months.

The satellite, will carry a supercomputer card in order to test different high-computing intensive algorithms under space environment. SAI-2 carry-on Analog Devices AD9375

|   |                   |                  |       |
|---|-------------------|------------------|-------|
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|   |                   | Date: 22/02/2021 |       |
|   |                   | SAI-2            | Pag:1 |

chips, integrated on the Node I Space AI card. Also, will carry Lime Microsystems LMS6002D inside the Nodes IO.

The platform satellite is Space AI integrated solution. The satellite main mission will be to test the Space AI Node I that is an advanced SDR communications card designed to be used on CubeSats missions, also will be attached to a wide band antenna. The other subsystem to be fly will be the MCC supercomputer to test different onboard processing, high intense computing algorithms. The last subsystem will be Node IO that intended to be help the deployment of cloud sensors on ground applications, the primary goal will be to test the system in space environment. The SAI-2 includes the following subsystems:

1. Space AI Node I cards
2. Space AI MCC Supercomputer cards
3. Space AI Node IO 0.5U subsystems
4. GPU COTS cards
5. Wideband antennas
6. Deployable Gallium Arsenide Solar Cells panels
7. EPS systems with a two 90WHr Lithium-Ion Battery packs

The SAI-2 Mission will not expect to have or produce any physical interference with other operational spacecraft.